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Review Article

DISASTER MANAGEMENT

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ABSTRACT

With the tropical climate and unstable land forms, coupled with high population density, poverty, illiteracy and lack of adequate infrastructure, India is one of the most vulnerable developing countries to suffer very often from various natural disasters, which strikes causing devastating impact on human life, economy and environment. Though it is almost impossible to fully recoup the damaged caused by the disaster it is possible to minimize potential risks by developing early warning strategies.

"Efficient management of Disasters, rather than mere response to their occurrence has, in recent times, received increased attention both within India and abroad."

Hospitals play a key role in Management of the affected population by providing immediate and effective treatment at the site and in the hospital.

Considering the wide range of disasters and no bar for time, place and people it requires immediate intervention, and this management would be an extension of emergency or casualty services of hospital. It adds an extra load to hospital, functions, and to cope up this situation it requires to have a systematic, planned and effective approach.

In this article, I have discussed a model disaster management plan for a hospital, clinical principles of management of casualties and specific problems of Disaster Management. A guide line for operational framework to face disaster in the form of Disaster manual is suggested for each hospital. A preplanned disaster management plan according to this guideline would provide an edge to a hospital in such crucial situations and in turn will serve the humanity & society.

Key Words: Disaster & Disaster Management.

INTRODUCTION

Disasters disrupt progress and destroy the hard-earned fruits of painstaking developmental efforts, often pushing nations, in quest for progress, back by several decades. Thus, efficient management of disasters, rather than mere response to their occurrence has, in recent times, received increased attention both within India and abroad. This is as much as result of the recognition of the increasing frequency and intensity of disasters as it is an acknowledgement that good governance, in a caring and civilized society, needs to deal effectively with the devasting impact of disasters.

India is vulnerable, in varying degrees, to a large number of natural as well as man-made disasters. 58.6 per cent of the landmass is prone earthquakes of moderate to very high intensity; over 40 million hectares (12 percent of land) is prone to floods and river erosion; of the 7,516 km long coastline, close to 5,700 km is prone to cyclones and tsunamis; 68 percent of the cultivate area is vulnerable to drought and hilly areas are at risk from landslides and avalanches.[1] Vulnerability to disasters/emergencies of Chemical, Biological, Radiological and Nuclear (CBRN) origin also exists. Heightened vulnerabilities to disaster risks can be related to expanding population, urbanization and industrialization, development within high- risk zones, environmental degradation and climate change.

In the context of human vulnerability to disasters, the economically and socially weaker segments of the population are the ones that are most seriously affected. Within the vulnerable groups, elderly persons, women, children – especially women rendered destitute and children orphaned on account of disasters and the differently able persons are exposed to higher risks.

Disaster can occur at any time, in any place and may result in death and injury. Disasters need not always call for surgical intervention but may also involve providing antidotes for chemical poisons (e.g. leakage of MIC in Bhopal) or controlling a disease which has assumed epidemic proportions. Disasters require immediate intervention. Therefore, disaster management is an extension of the emergency or casualty service of the hospital. Disasters may add an extra and immense load to the normal functioning of the hospital. Hence, each hospital needs to put systems in place for effective management of disasters.

Disaster can be defined as

"The occurrence of immediate threat of widespread or severe damage, injury loss of life or property resulting from any natural or manmade cause including, but not limited to, enemy attack, sabotage or any other hostile military or paramilitary action, fire, flood, earthquake, wind storm, ware action, epidemic, air contamination, drought, infestation, explosion or accident involving hazardous material and/or radiation by products."

According to Disaster Management Act 2005, a disaster refers to a "Catastrophe, mishap, calamity or grave occurrence from natural or manmade causes, which is beyond the coping capacity of the affected community".

Classification of Disasters

Disasters which require the intervention of a hospital can be due to :

- Extraneous factors affecting the community when casualties are being received by the hospital; or

- Intrinsic factors such as fire, flood and earthquake affecting hospital itself.

Natural Disasters	Man-Made Disasters
Natural Phenomena beneath the earth's surface • Earthquake • Tsunami • Volcanic eruption	Caused by warfare • Conventional Warfare • Nuclear, biological and chemical warfare.
Natural phenomena on the earth's surface • Landslide • Avalanche Meteorological/Hydrological phenomena • Windstorm (cyclone, typhoon, hurricane). • Tornado • Hailstorm / snowstorm • Sea Surge • Flood • Drought	Caused by accident • Vehicular (plane, train, ship, car etc.) • Drowning • Collapse of building • Explosion • Fire • Biological • Chemical, including poisoning.
Biological Phenomena • Locust Swarm • Disease epidemic	

Principles of Disaster Management Plan

Following principles should be considered before planning for disaster management :

1. The plan should be simple so that it can be understood by everyone and implemented easily and immediately.
2. The plan should be 'flexible' so that it can be adapted for all types of disasters.
3. It should be 'clear and concise' so that even in the noise and confusion, hospital staff can act upon it instantaneously.
4. It should be 'adequate' for all hours, i.e. day and night including holidays, when most of the staff is not available.
5. It should be an 'extension of the normal hospital working' so that people can act on it immediately.

Disaster Management Plan

The model disaster management plan involves initial alert, plan activation and formation of command nucleus.

1. Initial Alert

The hospital may be alerted by the emergency itself. This happens in cases where.

- The accident takes place near the hospital, or
- The hospital is informed on the telephone or through a person.

The person in the hospital who receives information about the disaster should gather details regarding casualties. These details include

- Place and time of accident;
- Estimated number and type of casualties; and
- Source of communication.

The place and time of accident determine the reaction time of the hospital while the type of casualty dictates the type of preparation required by the hospital.

2. Activation of the Hospital Disaster Management Plan

The designated hospital staff – casualty medical office, hospital controller, hospital administrator and senior specialists – should be responsible for activating the hospital disaster management plan. The switch-board operator, clerk on duty or casualty in-charge should notify key personnel, activate emergency departments such as radiology, Operation Theatre, blood bank, factory, medical stores, supportive services (dietary services, security staff and ambulances). The plan should give complete details of resource mobilization. Maximum number of staff should be available within 10 minutes of disaster notification. The matron or senior nursing officer on duty should prepare a pre-arranged ward to receive casualties.

3. Formulation of the Command Nucleus

The command nucleus, which includes the hospital controller, matron or senior nursing officer and hospital administrator, should formulated immediately and it should be near the casualty department. The roles of the members of the command nucleus are discussed below:

a. Hospital Controller

The hospital controller is the hospital superintendent or director who is responsible for :

- Detailing the staff reporting to him in the casualty department.
- Appointing the triage officer and medical controller for the ward, casualty department and Operation Theatre.
- Coordinating, organizing, communicating and assigning duties to medical officers. He may have to detail medical officer to go to the site, and if required rush the mobile medical team.

b. Senior Nursing Officer

The senior nursing officer is responsible for :

- Identifying nursing needs.
- Allocating extra nursing staff in essential areas.
- Re-deploying existing staff.
- Recalling of staff.
- Activating the pre-arranged admission ward.

c. Hospital Administrator

It is the hospital administrator's duty to

- Establish information services for relatives and friends.
- Liaise with various agencies such as the fire brigade and police.
- Deploy voluntary workers.

Clinical Principles of Management of Casualties

The clinical principles of management of casualties deal with admission, clinical services, triage and treatment of casualties.

a) Reception Centre - Admission

The victims of the disaster admitted to the hospital should be kept in the same ward irrespective of their age and sex, so that complete attention can be devoted to one ward and medical resources optimally utilized.

For Moderate Load :

The present casualty OPD will function as the reception area.

For Heavy Load **:**

The main hall of the ground floor OPD will be converted into the reception centre. The police & security personnel of the hospital will act as traffic controllers; directing patients & their relatives to proper areas.

b) Clinical Services

Clinical services such as radiology and pathology should not be routinely used for all patients. These could be deferred unless considered essential. However, cross-matching of blood should be done for all accident cases in the casualty department itself.

c) First Aid & Triage

Triage is a terminology used by the armed forces for allotment of priority for treatment and evacuation. This should be followed by each department and at each point, i.e. at the reception and resuscitation area and for evacuation of patients, since the priority may have to be changed from time to time.

For moderate Load : The existing casualty medical team will provide first aid and do the sorting.

For Heavy Load : The centre will be manned by 4 teams, each consisting of one general surgeon, orthopedic surgeon physician, anesthetist and two nurses. The responsibilities of first aid centre will be.

Quickly sorting out of casualties into :

i) Priority One :Needling immediate Resuscitation
ii) Priority Two : Immediate Surgery.
iii) Priority Three : Needing first aid & possibly surgery.
iv) Priority Four : Needing only first aid.

Action :

Priority one will be attended to int casualty Department & if necessary send to ICU.

Priority two will be transferred to casualty OT immediately.

Priority Three will be given first aid & admitted if bed is available or transferred to another hospital.

Priority Four will be given first aid and discharged.

d) Treatment of Casualties

The treatment at the site of accident, during transportation and in the casualty department should be restricted to 'basic life support', i.e. protection of airway, ventilator support (putting chest drain), control of hemorrhage, anti-shock treatment and preparation for transportation. Sophisticated treatment and 'advance life support' should be given in the hospital wards.

Specific problems of Disaster Management

The problems of disaster management can be clinical and administrative.

Clinical Problems

The patients reporting by themselves are generally not in a critical condition. Seriously ill patients are still at the site, waiting for help to come from the hospital. The initial patients indicate only the tip of the iceberg. They do not indicate the magnitude of disaster.

Specific clinical problems which need attention are those due to chemical leaks and nuclear holocaust. Their management has become absolutely essential after the Bhopal tragedy. Such catastrophes should be left for crisis management, but their management should be planned well in advance.

England and Wales, 47 hospitals are prepared to receive contaminated casualties, but none of our hospitals are prepared for such a contingency. The whole procedure of decontamination, isolation and use of protective clothing should be explained to the staff and rehearsed with the disaster management team.

Administrative Problems

The common administrative problems in disaster management involve :

a. Documentation

Proper documentation on previously structured forms should be done to save time. There may be problems of documentation in unconscious patients and those who are brought in dead. There should be four lists prepared for casualties – one to be kept by the hospital administrator, one to be sent to the police. Each patient should be tagged with a case sheet with treatment details, which should accompany him/her everywhere. The case sheet may be structured to save time.

b. Police Documentation Team

The police documentation team should be assisted by the hospital administrator. However, police investigation may be delayed if the hospital is very busy treating the casualties.

c. Communication

Telephone lines may be busy of faulty, hence inter-communication should be used to carry messages. The place of meeting of these messengers should be decided in advance.

Friends and Relatives

Anxious, excited friends and relatives want to know the welfare of their kith and kin and the hospital administrator or matron should calm them and give the latest possible details about their relatives.

d. Crowd Control

In case of a disaster, crowds gather at the hospital as they are curious to know what has happened and how it has happened. These should be controlled to avoid confusion. If the hospital does not have its own resources it should seek the help of a voluntary agency or police.

e. Voluntary Workers

Requirement of voluntary workers and their distribution should be decided by the hospital administrator. If their help is not needed, they should be politely told that they will be called when required.

f. Patients' Property

The normal procedure listing every single item of patients' property is not practicable in disaster. Separate large polythene bags should be kept for each patient admitted to the ward. Such a bag should have an attached label with the patient's name and registration number. The property should then accompany the patient to the ward, where it is sorted and listed at a later stage.

Many individuals carry very large sums of money in their clothing, but any attempt to isolate and secure individual items is likely to lead to greater loss than the indiscriminate insertion of all clothing and property into a large bag.

g. Press and Broadcasting Services

Dissemination of correct information is necessary to avoid rumours. There should be only one person, either the hospital administrator or hospital controller, authorized to give a press release in the hospital. Regular press bulletins may be required in some cases especially when VIPs are involved.

h. Disposal of the Dead

At times, the hospital mortuary may not be able to cope up with the large number of dead bodies. Therefore, arrangements for prompt disposal of the dead should be made.

Hospital Disaster Management Manual

As part of disaster management, every hospital must have a disaster management manual. This manual is a written statement of the disaster management plan to be followed during disasters. Hence, it should cover as many types of disasters as possible after thorough planning and deliberations.

The disaster management manual can be divided into the following five sections :

Section I - Introduction
Section II - Distribution of responsibilities.
Section III - Chronological action plan.
Section IV- Checklist of personnel and items.
Section V- Rehearsal and conclusion.

Section I - Introduction

The introduction of the disaster management manual should include the disaster alert code, general principles of conduct and a brief synopsis of the complete plan. It should also enumerate all aspects of disaster management such as activation and formation of command - nucleus.

A disaster alert code is a code word given for commencing a disaster management plan. When a message carrying this code word- is received by the staff, they should immediately report for duty. This saves valuable time as each second is crucial in case of a disaster. E.g. Code Blue, Code Red.

Section II - Distribution Of Responsibilities –

This section of the disaster management manual should include responsibility of individuals and departments. These cards describe in detail the responsibility and action to be taken by each key member of the hospital staff involved in disaster management such as hospital administrator, medical officer in-charge of casualty, matron, nursing officer, telephone operator, clerk, messenger and stretcher bearers. These cards can be issued to these people as soon as they – report for duty. The action cards may not serve any useful purpose If - the hospital does not get enough warning of casualties.

Section Ill - Chronological Action Plan

The disaster management manual should list and discuss salient points of TheIp1an in chronological order. One such format has been :discussed in the section on the Disaster Management Plan. The manual should also discuss the clinical problems in management of casualties and specific problems of disaster management

Section IV - Checklist Of Personnel and Items

The hospital disaster management manual should also have an appropriate and elaborate list for hospital disaster management planning. This will help in determining the degree of hospital preparation to deal with disasters This checklist can be evaluated and modified from time to time.

Section V - Rehearsal and Conclusion

The last section of the hospital disaster management manual should discuss rehearsals for disaster management. The periodicity and type -of rehearsal for disaster management should be explained.

They will test the plan and bring forth its lacunae. The plan can then be improved accordingly. Frequent rehearsals will help the hospital staff manage disasters effectively and efficiently.

CONCLUSION

There can be no tailor-made disaster plan for hospitals Based on the above considerations, a hospital should be prepared and keep ready a plan for implementation whenever required. Distribution of responsibilities to individuals and departments will facilitate the activation of action plans at the time of actual need. Rehearsal and mini drill programmes implementation would provide an edge to the disaster management, in turn this will reduce the mortality and mobility.

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